

SRS TB ANALYSIS

Files and cuts

Files/runs:

- Run 11 - 5 GeV, energy scan, planes 4-8, 10, 12, 14
- Run 74 – 5 GeV, channel 51, no FLAME, planes 1-8

W in front of the 1st sensor!

CR-RC filter

$$S(t) = A \frac{t-t_0}{\tau} \exp\left(-\left(\frac{t-t_0}{\tau}\right)\right) \theta(t-t_0)$$

A – amplitude (MIP), τ – shaping time, t_0 – time from signal arrival until reaching the maximum

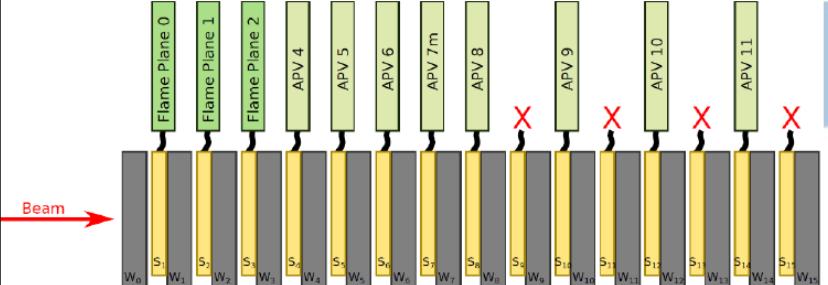
Signal cuts (to reduce noise):

Veta's cuts HG:

$$1 < \tau < 3, \quad 0 < \text{signal} < 2000 \quad 3 < t_0 < 7.5, \quad \text{nn} > 60\%$$

Veta's cuts LG:

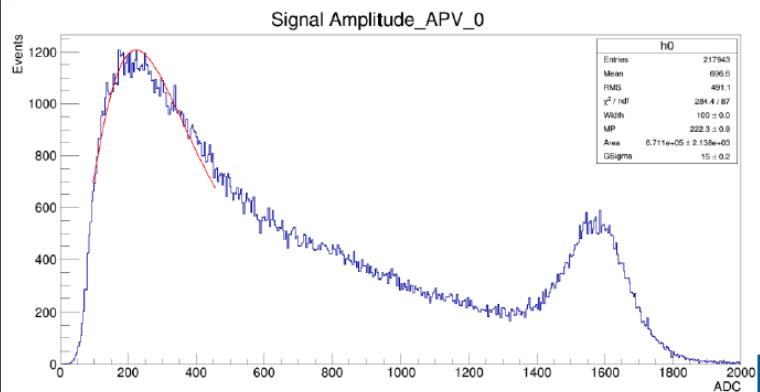
$$0.2 < \tau < 3, \quad 0 < \text{signal} < 2000 \quad 1.8 < t_0 < 5.5, \quad \text{nn} > 60\%$$



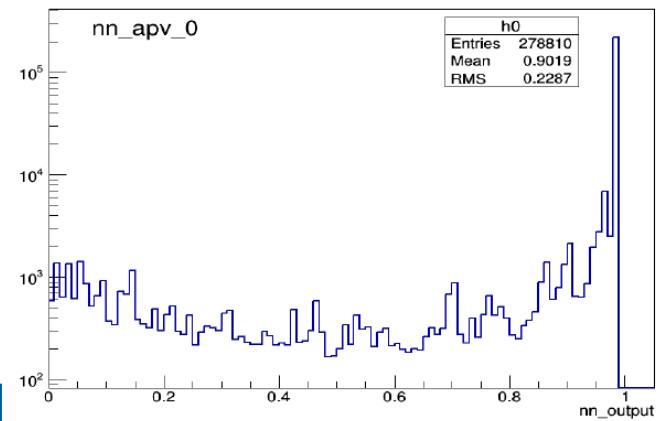
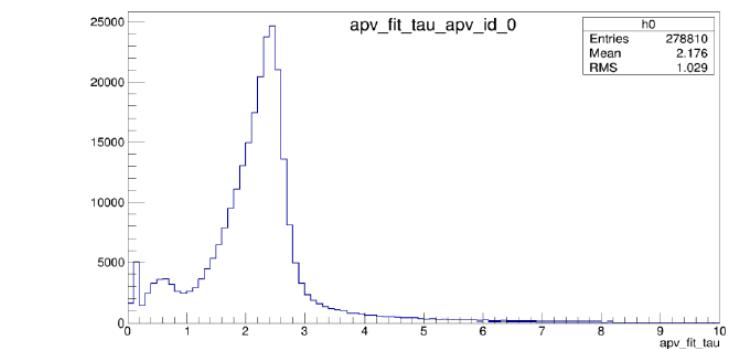
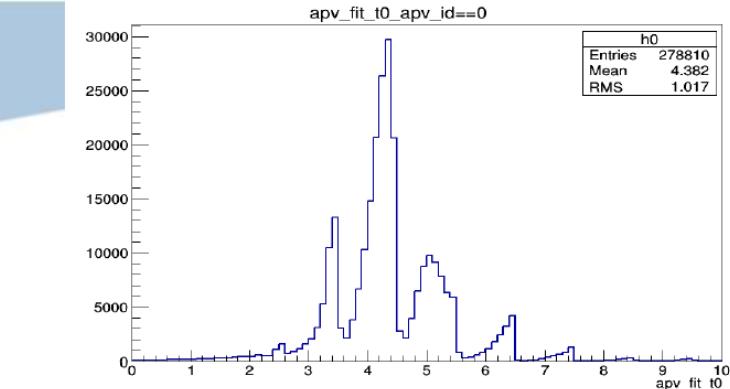
Set-up configuration for SRS run182

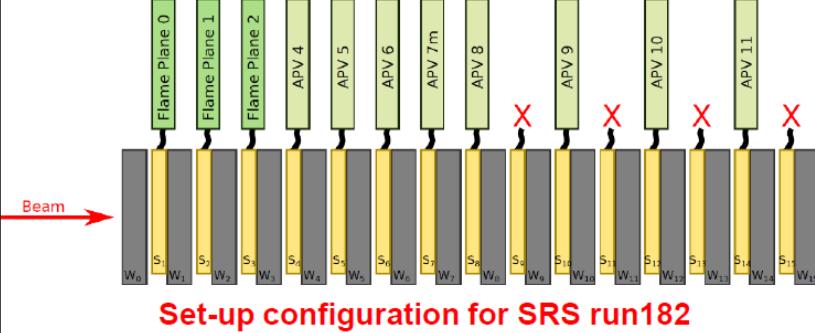
Signal selection: $S_{max} < 2000$ ADC

```
apv_reco->Draw("apv_signal_maxfit>>h0",
"apv_id==0 &&
apv_fit_t0>3.0 && apv_fit_t0<7.5 &&
apv_fit_tau>0.2 && apv_fit_tau<3 &&
apv_nn_output>0.6")
```



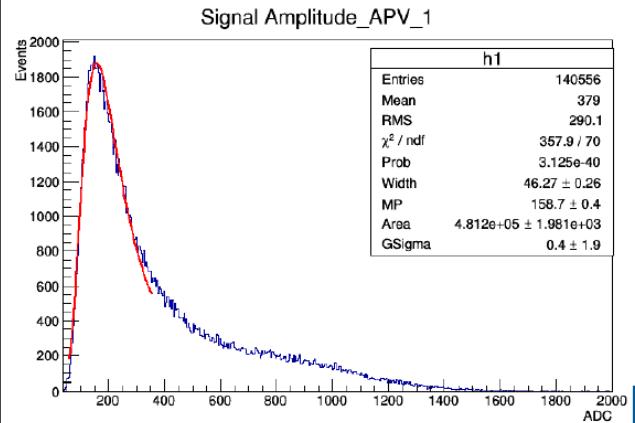
Taken from Veta's talk



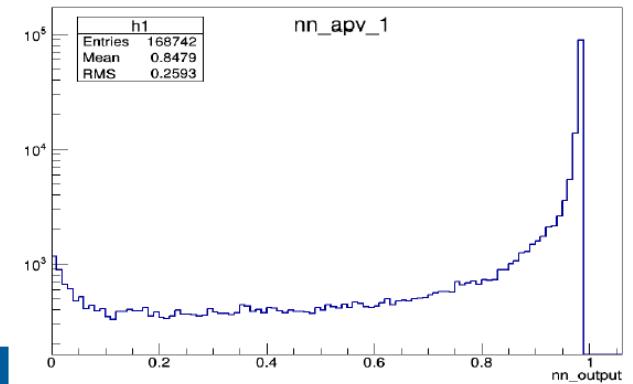
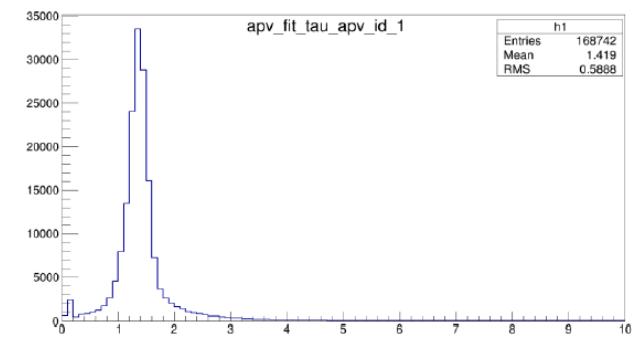
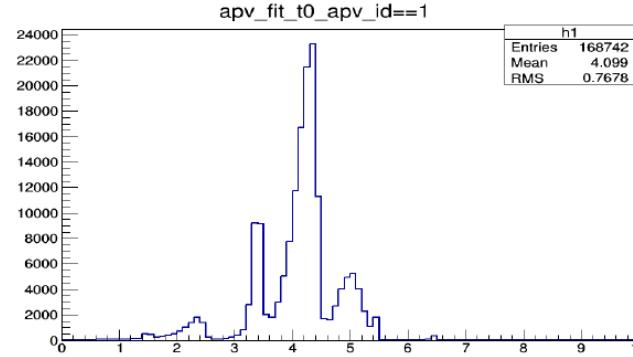


Signal selection: $S_{max} < 2000$ ADC

```
apv_reco->Draw("apv_signal_maxfit>>h0",
"apv_id==0 &&
apv_fit_t0>1.8 && apv_fit_t0<5.5 &&
apv_fit_tau>0.2 && apv_fit_tau<3.0 &&
apv_nn_output>0.6")
```



Taken from Veta's talk



Run 74, HG, energy in each plane

energy

APV0

htemp			
Entries	80459		
Mean	426.7		
Std Dev	353.7		

energy

APV2

htemp			
Entries	94744		
Mean	552.5		
Std Dev	389.9		

energy

APV4

htemp			
Entries	197231		
Mean	496.7		
Std Dev	468.6		

energy

APV6

htemp			
Entries	227674		
Mean	654.2		
Std Dev	500.6		

energy

APV8

htemp			
Entries	318460		
Mean	530.7		
Std Dev	477.4		

energy

APV10

htemp			
Entries	316275		
Mean	666.5		
Std Dev	530		

energy

APV12

htemp			
Entries	315595		
Mean	704.9		
Std Dev	529.8		

energy

APV14

htemp			
Entries	283700		
Mean	707.7		
Std Dev	503		

Run 74, LG, energy in each plane

energy

APV1

htemp
Entries 36462
Mean 236.5
Std Dev 134.2

energy

APV3

htemp
Entries 34921
Mean 234.1
Std Dev 129.7

energy

APV5

htemp
Entries 88357
Mean 350.9
Std Dev 241.9

energy

APV7

htemp
Entries 100882
Mean 389.8
Std Dev 294

energy

APV9

htemp
Entries 155192
Mean 393.7
Std Dev 304.1

energy

APV11

htemp
Entries 183460
Mean 425.8
Std Dev 315.7

energy

APV13

htemp
Entries 190604
Mean 402.3
Std Dev 290.7

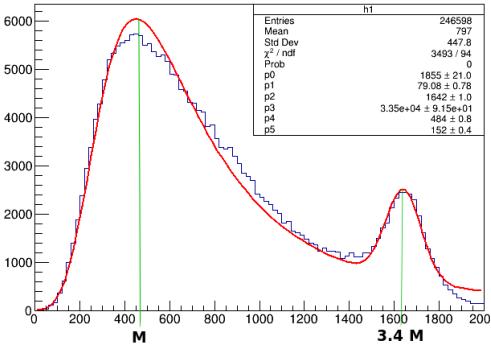
energy

APV15

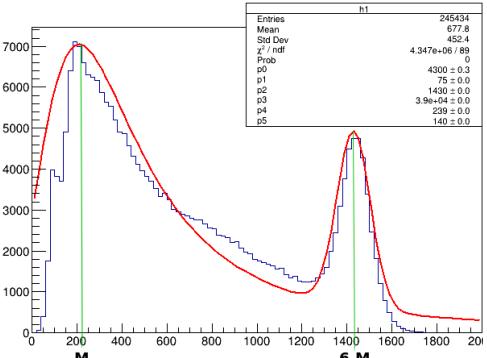
htemp
Entries 178143
Mean 334.8
Std Dev 233.1

Run 11, HG, energy and fit

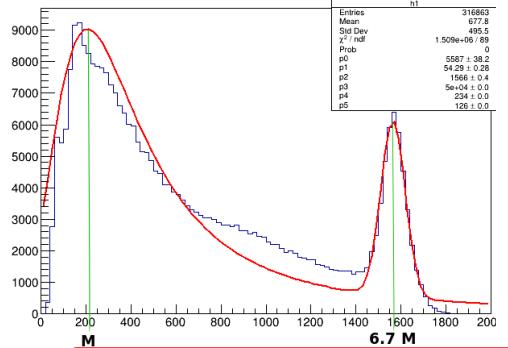
APV0



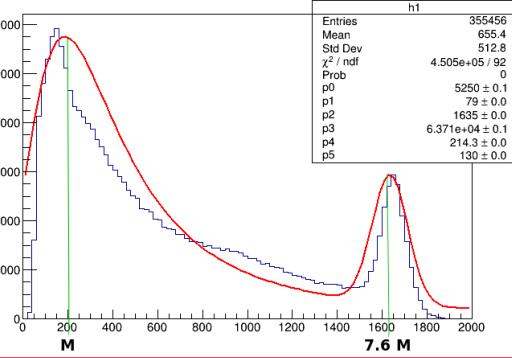
APV2



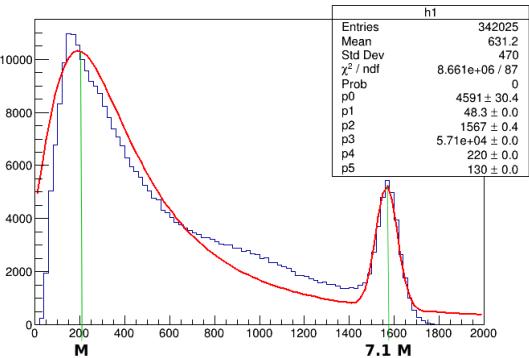
APV4



APV6

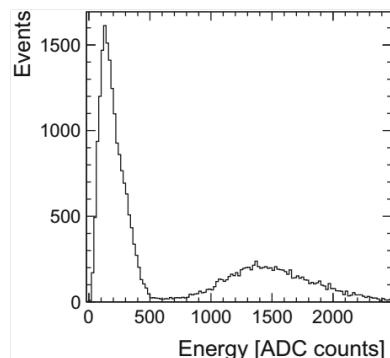


APV8



Fit parameters:

- p0 – Gaussian scale factor
- p1 – Gaussian σ
- p2 – Gaussian mean
- p3 – Landau scale factor
- p4 – Landau mean
- p5 – Landau σ

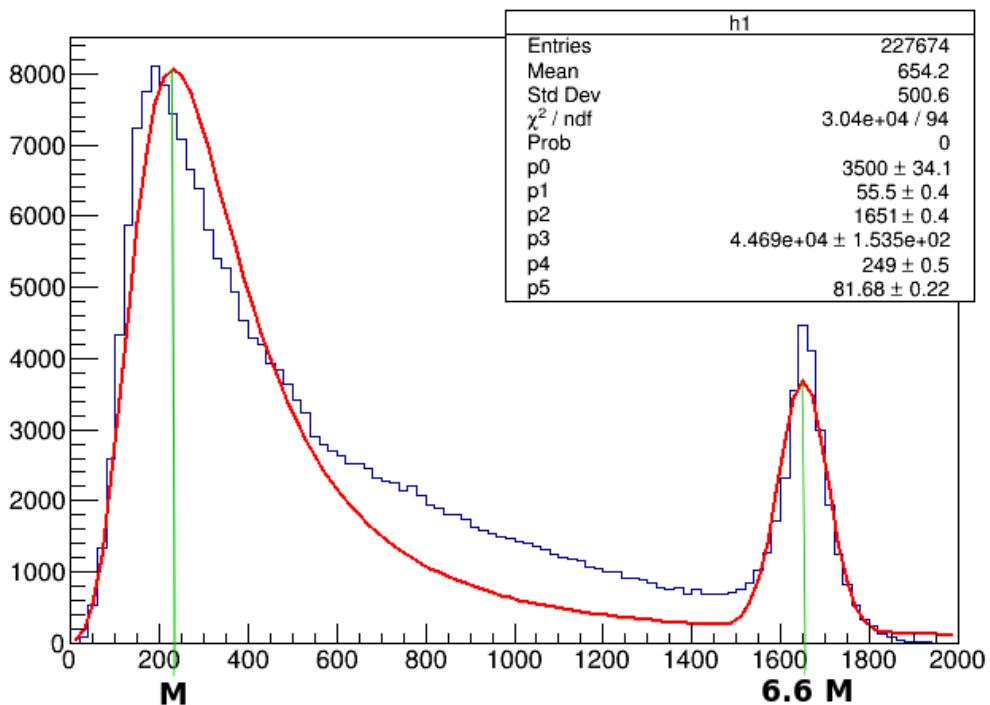


Measurement of shower development and its Molière radius with a four-plane LumiCal test set-up, Eur. Phys. J. C (2018) 78:135

Fig. 14 Energy deposition in the calorimeter for a beam comprising electrons and muons

Run 74, HG, energy and fit

APV6



Fit parameters:

- p0 – Gaussian scale factor
- p1 – Gaussian σ
- p2 – Gaussian mean
- p3 – Landau scale factor
- p4 – Landau mean
- p5 – Landau σ